

**Core Course**  
**Code: Bot CC-III 18403**  
**Title: Plant Systematics**  
**(Credits: Theory-4, Practical-2)**  
**THEORY**  
**Lectures: 60**

**Unit 1** **(12 lectures)**

Introduction to systematics; Plant identification, Classification, Nomenclature. Evidences from palynology, cytology, phytochemistry and molecular data. Field inventory; Functions of Herbarium; Important herbaria and botanical gardens of the world and India; Virtual herbarium; E-flora; Documentation: Flora, Monographs, Journals; Keys: Single access and Multi-access.

**Unit 2:** **(16 lectures)**

**Taxonomic hierarchy:** Concept of taxa (family, genus, species); Categories and taxonomic hierarchy; Species concept (taxonomic, biological, evolutionary).

**Botanical nomenclature:** Principles and rules (ICN); Ranks and names; Typification, author citation, valid publication, rejection of names, principle of priority and its limitations; Names of hybrids.

**Unit 3:** **(18 lectures)**

**Systems of classification:** Classification systems of Bentham and Hooker (upto series) and Engler and Prantl (upto series); Brief reference of Angiosperm Phylogeny Group (APG IV) classification.

**Biometrics, numerical taxonomy and cladistics:** Characters; Variations; OTUs, character weighting and coding; Cluster analysis; Phenograms, cladograms (definitions and differences).

**Unit 4:** **(14 lectures)**

**Phylogeny of Angiosperms:** Terms and concepts (primitive and advanced, homology and analogy, parallelism and convergence, monophyly, Paraphyly, polyphyly and clades). Origin and evolution of angiosperms; Co-evolution of angiosperms and animals; Methods of illustrating evolutionary relationship (phylogenetic tree, cladogram).

**Practicals**

1. Study of vegetative and floral characters of the following families (Description, V.S. flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification):



Ranunculaceae, Brassicaceae, Myrtaceae, Umbelliferae, Asteraceae, Solanaceae, Lamiaceae, Euphorbiaceae, Liliaceae, Poaceae (Representative type-Local)

2. Field visit (local) – Subject to grant of funds from the university.

3. Mounting of a properly dried and pressed specimen of any 10 wild plant with herbarium label (to be submitted in the record book).

### **Suggested Readings**

1. Singh, (2012). *Plant Systematics: Theory and Practice* Oxford & IBH Pvt. Ltd., New Delhi.

3<sup>rd</sup>edition.

2. Jeffrey, C. (1982). *An Introduction to Plant Taxonomy*. Cambridge University Press, Cambridge.

3. Judd, W.S., Campbell, C.S., Kellogg, E.A., Stevens, P.F. (2002). *Plant Systematics-A Phylogenetic Approach*. Sinauer Associates Inc., U.S.A. 2<sup>nd</sup> edition.

4. Maheshwari, J.K. (1963). *Flora of Delhi*. CSIR, New Delhi.

5. Radford, A.E. (1986). *Fundamentals of Plant Systematics*. Harper and Row, New York.

